Textbook Alignment to the Utah Core – Pre-Calculus

This alignment has been completed using an "Independent Alignment Vendor" from the USOE approved list (www.schools.utah.gov/curr/imc/indvendor.html.) ***Yes N/A No N/A***

Name of Company and Individual Conducting Alignment:
Dr. Don Collins

A "Credential Sheet" has been completed on the above company/evaluator and is (Please check one of the following):

X On record with the USOE.

☐ The "Credential Sheet" is attached to this alignment.

Instructional Materials Evaluation Criteria (name and grade of the core document used to align): Pre-Calculus Core Curriculum

Title: Trigonometry, 9th Edition (c) 2009, (Lial) ISBN#: 0131354809 (SE); 0321530438 (AIE);

Publisher: Pearson Education, Inc. publishing as Prentice Hall

Overall percentage of coverage in the *Student Edition (SE) and Teacher Edition (TE)* of the Utah State Core Curriculum: 45%

Overall percentage of coverage in *ancillary materials* of the Utah Core Curriculum: 33%

STANDARD I: Students will use the language and operations of algebra to evaluate, analyze and solve problems.

Percentage of coverage in the *student and teacher edition* for Standard I: 10%	**Percentage of coverage not in student or teacher edition, but covered in the *ancillary material* for Standard I: 70%**

OBJECTIVES & INDICATORS		Coverage in *Student Edition(SE) and Teacher Edition (TE)* (pg #'s, etc.)	Coverage in *Ancillary Material* (titles, pg #'s, etc.)	*Not covered in TE, SE or ancillaries* ✓
Objective 1.1: Compute with matrices and use matrices to solve problems.				
a.	Represent real-world situations with matrices.		**High School Mathematics Skills Review and Practice Workbook:** 210	
b.	Add, subtract, and multiply (including scalar multiplication) matrices using paper and pencil, and computer programs or calculators.	**334-335**	**High School Mathematics Skills Review and Practice Workbook:** 211-217	
c.	Demonstrate that matrix multiplication is associative and distributive, but not commutative.			
d.	Determine additive and multiplicative identities and inverses of a matrix when they exist.		**High School Mathematics Skills Review and Practice Workbook:** 214-215	
e.	Solve systems of linear equations with up to three variables using matrices.		**High School Mathematics Skills Review and Practice Workbook:** 216-217	
Objective 1.2: Analyze the behavior of sequences and series.				
a.	Describe a sequence as a function where the domain is the set of natural numbers.		The standard can be developed from: **High School Mathematics Skills Review and Practice Workbook:** 262-263	

b.	Represent sequences and series using various notations.		**High School Mathematics Skills Review and Practice Workbook:** 262-263	
c.	Identify arithmetic and geometric sequences and series.		**High School Mathematics Skills Review and Practice Workbook:** 262-263	
d.	Discover and justify the formula for a finite arithmetic series.		**High School Mathematics Skills Review and Practice Workbook:** 264	
e.	Discover and justify the formulas for finite and infinite geometric series.		**High School Mathematics Skills Review and Practice Workbook:** 265	
STANDARD II: Students will understand and represent functions and analyze function behavior.				
Percentage of coverage in the *student and teacher edition* for Standard II: <u>39</u> %		**Percentage of coverage not in student or teacher edition, but covered in the *ancillary material* for Standard II: <u>31</u>%**		
OBJECTIVES & INDICATORS		**Coverage in *Student Edition(SE) and Teacher Edition (TE)* (pg #'s, etc.)**	**Coverage in *Ancillary Material* (titles, pg #'s, etc.)**	***Not covered in TE, SE or ancillaries*** ✓
Objective 2.1: Analyze and solve problems using polynomial functions.				
a.	Raise a binomial to a power using the Binomial Theorem and Pascal's Triangle.		**High School Mathematics Skills Review and Practice Workbook:** 233	

b.	Determine the number and nature of solutions to polynomial equations with real coefficients over the complex numbers.	**372-373**	**High School Mathematics Skills Review and Practice Workbook:** 222, 224-225, 229, 231	
c.	Factor polynomials to solve equations and real-world applications.	**272-277**	**High School Mathematics Skills Review and Practice Workbook:** 222, 229	
d.	Understand the relationships among the solutions of a polynomial equation, the zeros of a function, the *x*-intercepts of a graph, and the factors of a polynomial.	**277**	**High School Mathematics Skills Review and Practice Workbook:** 222, 224, 229, 231	
e.	Write an equation with given solutions.		**High School Mathematics Skills Review and Practice Workbook:** 227, 230	
Objective 2.2: Model and graph functions and transformations of functions.				
a.	Model real-world relationships with functions.	**440, 442, 444-447**		
b.	Graph rational, piece-wise, power, exponential, and logarithmic functions.		**High School Mathematics Skills Review and Practice Workbook:** 105, 243	
c.	Identify the effects of changing the parameter a in $y = af(x)$, $y = f(ax)$, $y = f(x - a)$, and $y = f(x) + a$, given the graph of $y = f(x)$.		**High School Mathematics Skills Review and Practice Workbook:** 202	
Objective 2.3: Analyze the behavior of functions.				
a.	Identify the domain, range, and other attributes of families of functions and their inverses.	**440-442, 444,-447**		

b.	Approximate instantaneous rates of change and find average rates of change using graphs and numerical data.			
c.	Identify and analyze continuity, end behavior, asymptotes, symmetry (odd and even functions), and limits, and connect these concepts to graphs of functions.	**145-146, 168-169, 179, 453**		
d.	Determine intervals over which a function is increasing or decreasing, and describe the intervals using interval notation.	**428, 447**		
e.	Relate the graphical representation of discontinuities and end behavior to the concept of limit.			

STANDARD III: Students will use algebraic, spatial, and logical reasoning to solve geometry and measurement problems.

Percentage of coverage in the *student and teacher edition* for Standard III: <u>100</u>%	**Percentage of coverage not in student or teacher edition, but covered in the *ancillary material* for Standard III: N/A**

OBJECTIVES & INDICATORS		**Coverage in *Student Edition(SE) and Teacher Edition (TE)* (pg #'s, etc.)**	**Coverage in *Ancillary Material* (titles, pg #'s, etc.)**	***Not covered in TE, SE or ancillaries*** ✔
Objective 3.1: Solve problems using trigonometry.				
a.	Define the six trigonometric functions using the unit circle.	**23-25, 118-122, 200-201**		
b.	Prove trigonometric identities using definitions, the Pythagorean Theorem, or other relationships.	**30-31, 35, 200-201, 215-217, 224-225, 235-236**		
c.	Simplify trigonometric expressions and solve trigonometric equations using identities.	**200-203, 207-210, 272-277**		
d.	Solve problems using the Law of Sines and the Law of Cosines.	**303-307, 319-322**		
e.	Construct the graphs of the trigonometric functions and their inverses, and describe their behavior, including periodicity and amplitude.	**145-149, 169-172, 176-179**		

Objective 3.2: Graph curves using polar and parametric equations.				
a.	Define and use polar coordinates and relate them to Cartesian coordinates.	**392-396, 399-400, 432-437**		
b.	Represent complex numbers in rectangular and polar form, and convert between rectangular and polar form.	**362-363, 372-375**		
c.	Translate equations in Cartesian coordinates into polar coordinates and graph them in the polar coordinate plane.	**392-394**		
d.	Multiply complex numbers in polar form and use DeMoivre's Theorem to find roots of complex numbers.	**378-380, 384-388**		
e.	Define a curve parametrically and draw parametric graphs.	**405-407, 409-411**		
Objective 3: Solve problems involving the geometric properties of conic sections.				
a.	Write equations of conic sections in standard form.	**247, 407, 436-437, 452-454**		
b.	Identify the geometric properties of conic sections (i.e., vertex, foci, lines of symmetry, directrix, major and minor axes, and asymptotes).	**453-454**		
c.	Solve real-world applications of conic sections.	**247, 409-411, 451**		
STANDARD IV: Students will understand concepts from probability and statistics and apply statistical methods to solve problems.				
Percentage of coverage in the *student and teacher edition* for Standard IV: <u>11</u> %		**Percentage of coverage not in student or teacher edition, but covered in the *ancillary material* for Standard IV: <u>44</u>%**		
OBJECTIVES & INDICATORS		**Coverage in *Student Edition(SE) and Teacher Edition (TE)* (pg #'s, etc.)**	**Coverage in *Ancillary Material* (titles, pg #'s, etc.)**	***Not covered in TE, SE or ancillaries*** ✓

Objective 4.1: to calculate approximate probabilities.				
a.	Obtain sample spaces and probability distributions for simple discrete random variables.		**High School Mathematics Skills Review and Practice Workbook:** 267	
b.	Compute binomial probabilities using Pascal's Triangle and the Binomial Theorem.		An opportunity to address this standard can be found on: **High School Mathematics Skills Review and Practice Workbook:** 272	
c.	Compute means and variances of discrete random variables.		**High School Mathematics Skills Review and Practice Workbook:** 269-270	
d.	Compute probabilities using areas under the Normal Curve.		**High School Mathematics Skills Review and Practice Workbook:** 273	
e.	Calculate parameters of sampling distributions for the sample average, sum, and proportion.			
f.	Calculate probabilities in real problems using sampling distributions.		**High School Mathematics Skills Review and Practice Workbook:** 267	
Objective 4.2: Analyze bivariate data using linear regression methods.				
a.	Fit regression lines to pairs of numeric variables and calculate the means and standard deviations of the two variables and the correlation coefficient, using technology.	**163-165**		
b.	Compute predictions of *y*-values for given *x*-values using a regression equation, and recognize the limitations of such predictions.			
c.	Compute and use the standard error for regression.			